DESCRIPTIONS OF TWO NEW SPECIES OF **OKENIA** (Nudibranchia, Doridacea) FROM SOUTH-EASTERN AUSTRALIA

By Robert Burn

(Honorary Associate in Conchology, National Museum of Victoria, Melbourne).

(Plates X-XI, text-figs. 1-5).

SUMMARY

The phanerobranch doridacean genus *Okenia* is recorded for the first time from Australia. Two new species are described, *O. pellucida* from Sydney Harbour, New South Wales and *O. mija* from central Victoria.

INTRODUCTION

For the past few years, the presence of the genus *Okenia* among the Australian Opisthobranchia has been known to the writer from specimens collected at two localities on the central Victorian coastline. These were recognized as a new species and set aside for description. More recently, specimens of a second species from Sydney Harbour were received for identification from Miss Isobel Bennett. Though common on its polyzoan habitat, this second species proved to be a new species also.

Okenia Menke[1] (1830) is a well known genus with about 20 species distributed throughout the Atlantic, Pacific and Indian Oceans. The diagnostic characteristics uniting the species are (a) the presence of papillae along the notal or pallial brim and (b) two teeth on each side of the bare rhachis of the radula. Two subgenera are recognized: *Okenia* s.s. with papillae or appendages in the middle of the back and *Idaliella* Bergh (1881) with a bare middle back. As both species described here have papillae in the middle of the back, they belong to *Okenia* s.s.

The writer is deeply indebted to Miss Isobel Bennett for the specimens of *O. pellucida,* as well as notes on its habitat, colour transparencies of the living slugs, and the black and white photographs reproduced below. This paper is part of a wider study of the Opistobranchia of Australia. The research for this paper was completed while the writer was in receipt of a grant from the Science and Industry Endowment Fund, C.S.I.R.O.

DESCRIPTIONS

Order NUDIBRANCHIA
Suborder DORIDACEA
Section EUDORIDACEA
Tribe PHANEROBRANCHIA
Superfamily SUCTORIA
Family GONIODORIDIDAE

Hitherto this family was represented in Australian seas by *Goniodoris meracula* Burn (1958: 27) and *Eucrairia mapae* (Burn, 1961: 102), both from Torquay, Victoria.

Okenia pellucida sp. nov.

(Pls. X-XI; text-figs. 1-3).

Material: NEW SOUTH WALES. Neutral Bay, Sydney Harbour, 20 April 1966, 3 specimens, Miss Isobel Bennett, Australian Museum reg. nos. C.63092 (Holotype) and C.63093 (Paratypes).

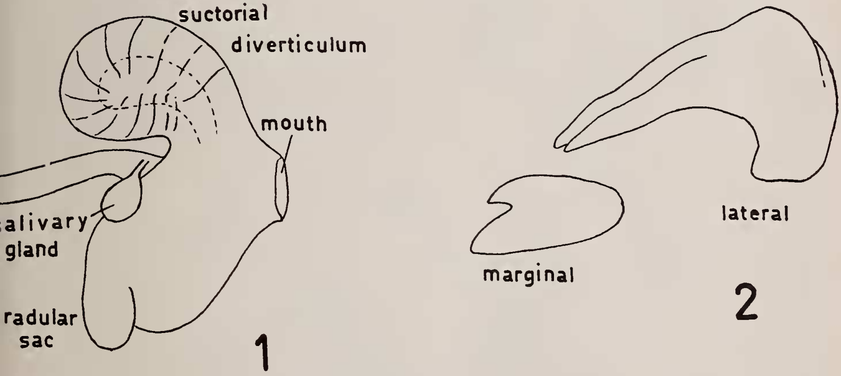
---

[1] Menke, 1830, Synops. method. mollusc., ed. 2, p. 10. Type-species, *Idalia elegans* Leuckart, 1828.

Habitat: In numbers on long clumps of the Polyzoan, *Zoobotryon pellucidus,* which grows on wharf piles, floating pontoons, under small boats, etc.

Description: The live slugs are about 10 mm. in length; the three preserved slugs examined are 7, 7, 6 mm. long. Live coloration (pl. X) is translucent yellowish, the viscera darker; everywhere except upon the sole with an anastomosing pattern of dark brown lines, even between the branchiae and on the inner and outer sides of the branchial stems. In one specimen, these lines are thicker and more numerous, and consequently the animal appears to be darker. The rhinophores have a chocolate-brown band at the third quarter and white tips. The branchiae are wholly transparent. Preserved animals retain the brown patterning of lines.

The body (Pl. X) is slender throughout and higher than wide at the pericardial eminence anterior to the branchiae. The notum is set off from the sides and the long tail by a notal brim bearing seven to ten simple conical papillae along each side. The two papillae in front of the rhinophores are somewhat longer than the others. The middle line of the notum bears three papillae between the rhinophores and branchiae and often a smaller papilla behind the branchiae. On each side of the middle line anterior of the branchiae stands another series of one to three papillae. The oral tentacles are distinct and ear-shaped as in *O. distincta* Baba (1940: 195, fig. 3). The rhinophores are long and tapering, with seven to twelve cup-like lamellae projecting from the rear edge of the upper half. Branchiae six, simply pinnate and standing in a small circle on the notum.



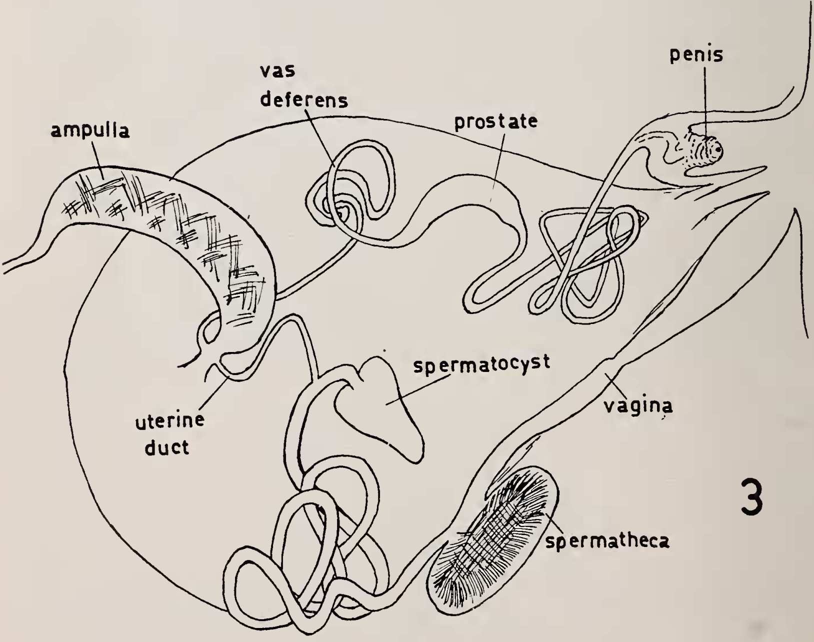
Okenia pellucida Burn.

Figure 1. — Pharynx from right side

Figure 2. — Half row of radula

The small pharynx (text fig. 1) is oval in shape with the radular sac projecting beyond the posterior ventral wall. The suctorial diverticulum is nearly equal in size to the pharynx, its neck is narrower. The salivary glands are flat and broadly oval. The whole of the anterior pharynx and the lumen of the diverticulum is lined by a strong hyaline cuticle. A pair of small thickened pads stand at the mouth, their surface is smooth. The radular formula is 28 x 1.1.0.1.1; lateral tooth (text fig. 2) hook-shaped, the tip appearing bifid at certain angles, with a smooth cutting edge along one side of the cusp. Marginal tooth smaller, wider than high and with two blunt cusps on the outer side.

The genital organs (text fig. 3) have a large lunate ampulla branching to male, female and gland mass ducts. The vas deferens is extremely slender, very long and much coiled. At its inner third there occurs a small short prostatic dilation. The penis is short but capable of extension, conical, smooth and wholly unarmed. The vagina has strong muscular walls at its wider section near the atrium and is narrower at the inner section. The ovoid spermatheca is filled with dark brown matter in the three examined specimens and is visible without dissection. The inner vagina is narrower again, very long and much coiled; at its end lies the pyriform spermatocyst. The uterine duct is very slender and short.



3

Okenia pellucida Burn.

Figure 3. — Genital organs.

The egg strings (Pl. XI, fig. 2) are laid haphazardly among the branches of the Polyzoan *Zoobotryon pellucidus* (Pl. XI, fig. 1). The diameter of the strings is about 1 mm. The eggs are extremely small.

Discussion: *O. pellucida* is a very distinctive species in a number of ways: (a) translucent yellowish body with the patterning of brown lines all over, (b) the absence of jaw plates or elements, (c) the smooth cutting edge on the lateral tooth, (d) the small prostrate gland, very long vas deferens and unarmed penis, and (e) the very long and coiled vagina.

Marcus (1957: 436, 438) lists 17 species and two subspecies of *Okenia*. To these have been added *O. opunta* and *O. plana* Baba (1960: 80) and *O. babai* Hamatani (1961: 117) from Japan, and *O. angelensis* Lance (1966: 76) from the Californian coasts of Mexico and the United States of America. *O. pellucida* has been compared with all these species from which it is especially distinguished by coloration, both living and preserved.

At Bermuda in the north-west Atlantic, a closely allied species, *Bermudella zoobotryon* (Smallwood, 1910: 143) lives on the same polyzoan species as *O. pellucida*. The genus *Bermudella* differs from *Okenia* only in the absence of the marginal radular tooth. The only species, *zoobotryon*, has similar body shape and papillation to *O. pellucida* but is separated by light brown irregular patches marked by darker brown streaks on a whitish body.

Okenia mija sp. nov.

(Text figs. 4-5).

Material: VICTORIA. Point Danger, Torquay, 21 November 1960, 1 specimen, R. Burn, National Museum of Victoria reg. no. F26138 (Holotype). Reef platform west of lighthouse, Point Lonsdale, 22 September 1963, 1 specimen, R. Burn, National Museum of Victoria reg. no. F26139 (Paratype).

Habitat: Holotype crawling on *Enteromorpha*-like alga at low tide level, Paratype crawling on brown kelp in large pool.

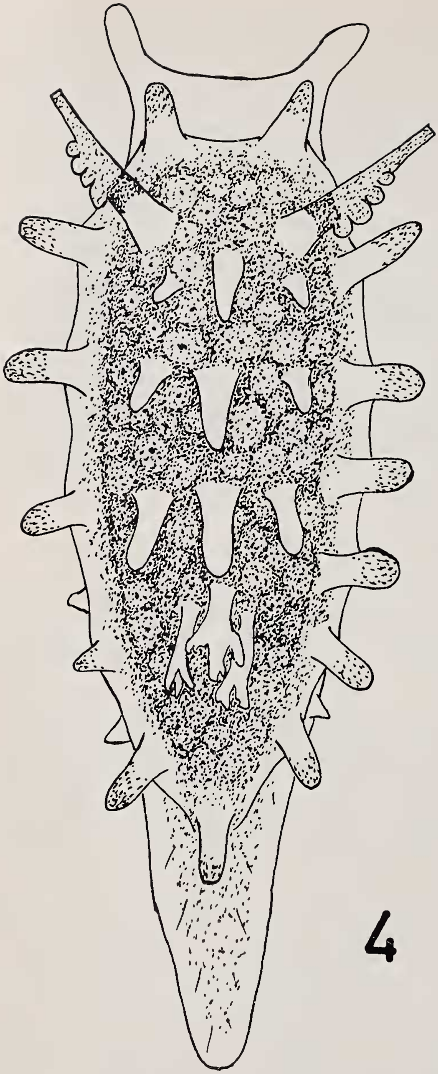
Description: The live slugs were 4.5 and 3 mm. in length. Coloration alive was pale brown body, everywhere with ochraceous yellow spots the centre of which was a black speck. Notal brim, foot edges and papillae bases speckled with white. Rhinophores with white base and brown band at second quarter. Branchiae brown and fawn with black specks. Sole of foot cream. Preserved animals fawn with some orange-brown patches.

Animal (text figs. 4-5) elongate-oval, wider than high. The notum is set off from the sides and slender tail by a notal brim bearing five to seven round-ended cylindrical papillae along each side and one in the rear middle line. The larger specimen (Holotype) had a further three papillae in a middle line series between rhinophores and branchiae and another three smaller papillae each side of the middle line series. The smaller specimen had only two papillae in the middle line series and one small papilla each side of this. The oral tentacles are digitiform and the head is wide. The rhinophores are tapering, with 4-5 bilobed lamellae on the rear of the upper half. The branchiae are three in number and bipinnate.

The jaws, radula and genital organs have not been examined.

Discussion: *O. mija* is easily separated from the New South Wales *O. pellucida* by its more oval shape, fewer notal brim papillae and the black speckled yellow and brown coloration. It is less easily separated from similarly shaped species such as *O. echinata* and *O. japonica* Baba (1949: 45-46, 138), *O. plebeia* (Bergh, 1902: 186) and *O. evelinae* Marcus (1957: 438), but in each case the coloration is different.

The specific name is formed from an Australian aboriginal word "mije", signifying little.



Okenia mija Burn.

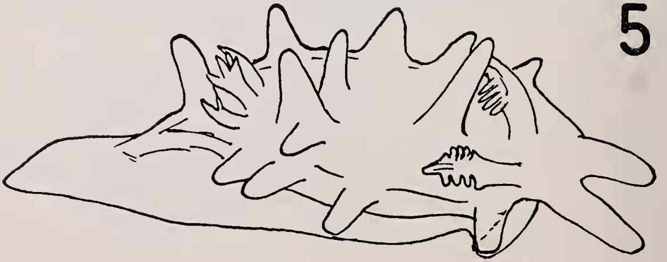
Figure 4. — Dorsal view of living Holotype.

4

Okenia mija Burn.

Figure 5. — Right dorso-lateral view of preserved Paratype.

5



REFERENCES

Alder, J. and Hancock, A., 1845-1855.—*A Monograph of the British Nudibranchiate Mollusca,* Pts. 1-7, 438 pp., 84 pls. London (Ray Society).

Baba, K., 1940.—Some additions to the Nudibranch fauna of the northern part of Japan. *Bull. Biogeogr. Soc. Japan,* 10(6): 103-111.

————, 1949.—*Opisthobranchia of Sagami Bay* etc. 194 + 7 pp., 50 pls. Tokyo (Iwanami Shoten).

————, 1960.—The genera *Okenia, Goniodoridiella* and *Goniodoris* from Japan. *Publ. Seto Mar. Biol. Lab.,* 8(1): 79-83, pl. 7-8.

Bergh, R., 1902.—Dan. Exp. Siam. I. Gasteropoda opisthobranchiata. *Dansk. Vid. Selsk. Skr.,* nat. (6), 12(2): 159-218, pl. 1-3.

Burn, R., 1958.—Further Victorian Opisthobranchia. *J. Malac. Soc. Aust.,* 2: 20-36, pl. 6-7.

————, 1961a.—*Drepaniella mapae* gen. et spec. nov., a new Gonidoridid Nudibranch from south-eastern Australia. *Veliger,* 3(4): 102-104.

————, 1961b.—*Eucrairia* nom. nov. for *Drepaniella* Burn. *Veliger,* 4(1): 51.

Eliot, C., 1910.—*A Monograph of the British Nudibranchiate Mollusca,* 8 (Suppl.). 198 pp., 8 pls. London (Ray Society).

Hamatani, I., 1961.—Preliminary account of a new species of *Okenia* from Osaka Bay, Japan. *Publ. Seto Mar. Biol. Lab.,* 9(2): 363-365.

Lance, J., 1966.—New distributional records of some North-eastern Pacific Opisthobranchiata with descriptions of two new species. *Veliger,* 9(1): 69-81.

Macnae, W., 1958.—The families Polyceridae and Goniodorididae in southern Africa. *Trans. Roy. Soc. S. Afr.,* 35(4): 341-372, pl. 17-18.

Marcus, E., 1957.—On Opisthobranchia from Brazil (2). *J. Linn. Soc. London,* Zool., 43: 390-486.

Marcus, E. and E., 1960.—Opisthobranchs from American Atlantic warm waters. *Bull. Mar. Sci. Gulf and Caribb.,* 10(2): 129-203.

Pruvot-Fol, A., 1954.—*Faune de France,* 58: Mollusques Opisthobranches, 460 pp., pl. 1. Paris (Paul Lechevalier).

Smallwood, W., 1910.—Notes on the hydroids and nudibranchs of Bermuda. *Proc. Zool. Soc.,* 1910: 137-145.

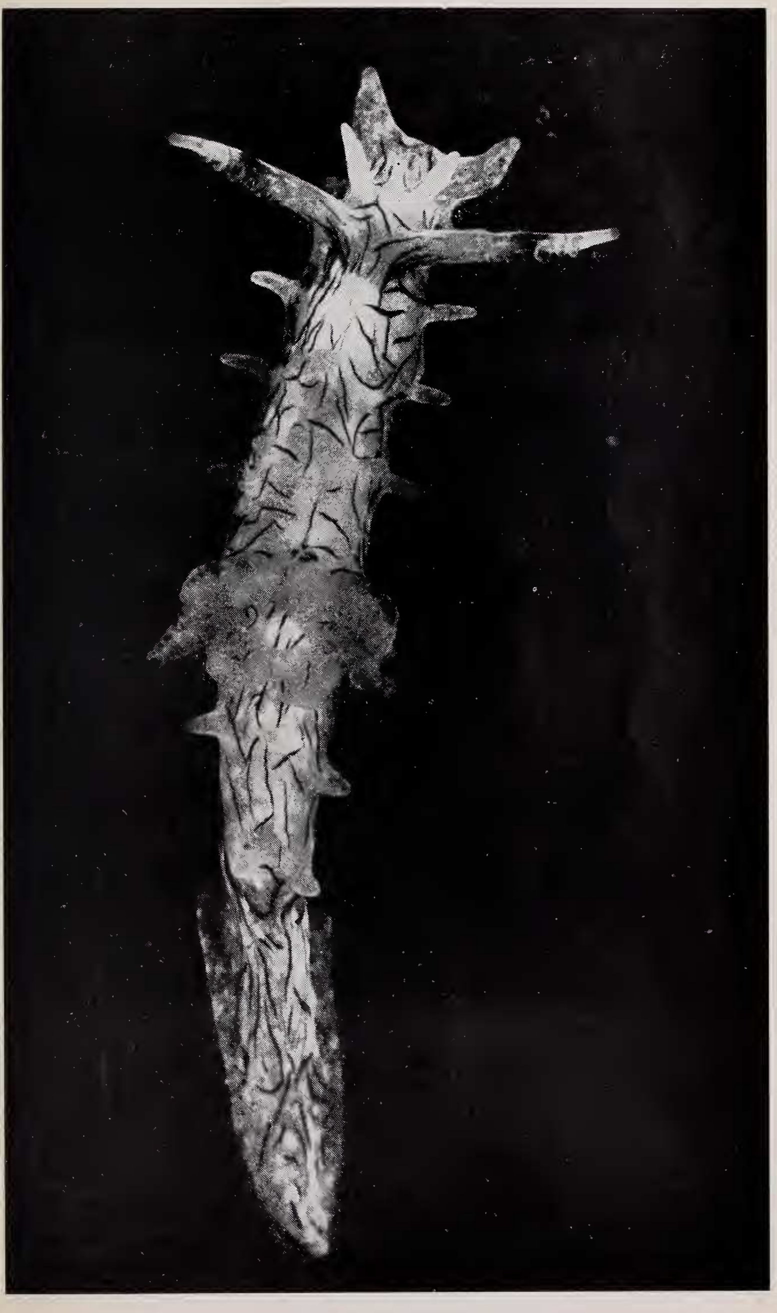
EXPLANATION OF PLATES X-XI

Plate X. *Okenia pellucida* sp. nov., dorsal view of the fully expanded crawling animal (fifteen times natural size).

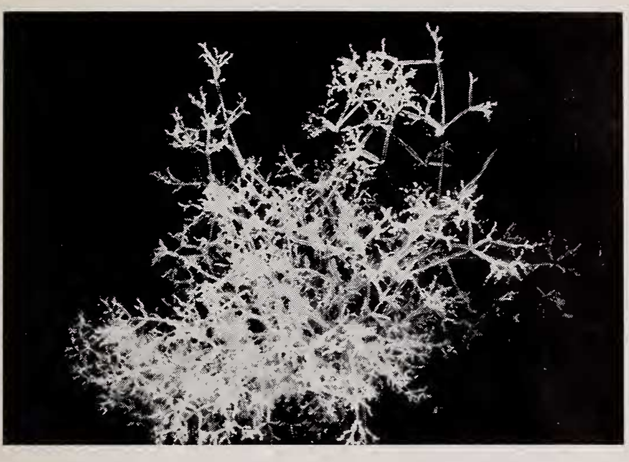
Plate XI, fig. 1. Part of a colony of the Polyzoan, *Zoobotryon pellucidus,* on which up to 12 slugs were feeding (one-quarter natural size).

Plate XI, fig. 2. Egg strings of *Okenia pellucida* laid on *Zoobotryon* (three times natural size).

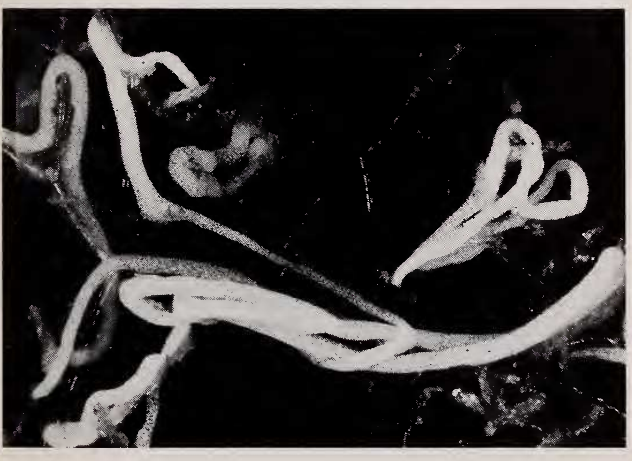
Photographs: Isobel Bennett and F. G. Myers.



Okenia pellucida Burn.
(Magnified fifteen times).



1. Polyzoan, *Zoobotryon pellucidus.*



2. Egg-strings of *Okenia pellucida.*
(For explanation, see page 57).